A

Synopsis of Ph.D. studies entitled:

"Assessment of Ground Water Quality Status of Udgir Dist. Latur Maharashtra"

To be submitted to

SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY,

NANDED

by
Miss.ShubhangiVagambarMalude
Research Student

Under the Guidance of
Dr. NARKHEDE R. K.
Research Guide in Environmental Science,
Maharashtra Udayagiri Mahavidyalaya, Udgir
Affiliated
To
Netaji Subhashchandra Bose College, Nanded

INDEX

Sr. No.	Chapter	Page. No.
01	Introduction	3
02	Review of Literature	4
03	Aims and Objectives	5
04	Methodology	5
05	Importance of Study	6
06	Study Area	7
07	Work Plan	8
08	References	8

“Assessment of Ground Water Quality Status of Udgir Dist. Latur Maharashtra”

Abstract

Water is the most vital element for the survival of living system on the Earth. But all the water is not usable because 97% of water is saline water. In 3% of water, surface and ground water is available for the human use. Ground water is most important because it is available everywhere. As human being is exploiting this water very rapidly the level of ground water is deepening day by day also the quality of water. In Maharashtra speciallyUdgir is the region where no major river is present. So all the people are dependent on the ground water. The level of water is about 500 feet and more at this level water quality also deteriorates. So , the present study has been undertaken for the ground water quality status of Udgir.

Introduction

Water covers about 75% of the earth’s surface in the form of oceans, Sea, Rivers, and lakes. Oceans contain about 97% of all the water on the earth. Of the remaining water, a sizeable amount is locked in the frozen form in the Polar Regions and glaciers. Only about 1 % is available as fresh water. (Ahluwalia, V.K.2015).

Today the cry of “Environmental Pollution” is heard from all corners of the world. Pollution has now become a distinct threat to the very existence of mankind on this earth. It is now a major challenge of our times. For centuries man has been disturbing the balance of nature for comfort, wealth and ego but now nature has started disturbing the balance of nature.

Water pollution is not a new problem except in dimensions which we face today. Man has been using water around him for dumping wastes. In the early stages of human history, domestic discharges probably posed no problem as nature has the capacity to degrade waste and restore normal conditions. Nature still does, but with the advent of urbanization and industrialization we have been overloading the systems beyond their tolerance limit.

Literature review

In the year 2009 C.R. Ramakrishnaiah, et al., studied on, 'Assessment of Water Quality Index for the Groundwater in TumkurTaluk, Karnataka State (India).' They observed Many water samples were poor in quality; the analysis shows that the groundwater of that area required some treatment before utility.S.K.Tyagi et.al in 2009 undertaken, Hydrochemical appraisal of groundwater and its suitability in the intensive agricultural area of Muzaffarnagar district, Uttar Pradesh, India, observed that the chloride, sulphate are in higher levels in ground water.

M Prasanna et.al in 2010 studied onhydrochemical characteristics of surface and sub-surface water in and around Perumal Lake, Cuddalore district, Tamil Nadu, South India evaluated the suitability of groundwater for irrigation quality and found the ground water is suitable for irrigation purpose.RNagrajan et.al in 2010 studied "Evaluation of groundwater quality and its suitability for drinking and agricultural use in Thanjavur city, Tamil Nadu, India," found that ground water quality is impaired by manmade activities.N.Aghazadeh, A.Mogaddam, in 2011 done "Investigation of hydrochemical characteristics of groundwater in the Harzandat aquifer, Northwest of Iran and observed ground water inthis area is chemically unsuitable for drinking and irrigation purpose.D.Alexakis, in 2011 make investigation on "Assessment of water quality in the Messolonghi–Etoliko and Neochorio region (West Greece) using hydrochemical and statistical analysis methods and found ground water in this area is suitable for irrigation.

Z.Ahmad, A.Qadir, in 2011 studied "Source evaluation of physic chemically contaminated groundwater of Dera Ismail Khan area, Pakistan,and found that the bicarbonates,EC and sulphates are more than permissible levels.In the year 2012 Sarla and Ravi Babu P observed the ground water quality in Jawaharnagar Hyderabad was found polluted In the year 2012 Patil, et al., studied completely different physical, chemical and trace metal parameters for testing of water quality. The standard of potable water ought to be checked at regular interval.In the year 2013 Udit Mohan, et al., studied on, 'Water quality assessment and physico-chemical parameters of groundwater in district Hapur, Uttar Pradesh, India.' present study reveals that the quality of water is not suitable for drinking purpose, and therefore it must to be guarded from pollution.In the year 2017 V.Jena, et al., studied on, 'Physico chemical analysis of ground water of selected area of Raipur city.' In this study, during 2015-2016 assessment of physico chemical parameters is done for Raipur city. They conclude regular chemical analysis must be done.In the year 2018 JyotiBansal and A.K.Dwivedi investigated on "Assessment of Ground water quality by using

water quality index and physicochemical parameters :Review paper, they found that results of water quality assessment showed that some water quality parameters slightly higher in wet season as compare to summer season. Shaikh Ibrahim et. Al. in 2019 studied A review on ground water quality Assessment of Akkalkuwa Region Nandurbar (Maharashtra), reported that the total solids were above permissible limits

Aims and Objectives:

- To assess current groundwater condition
- To find out the nature and extent of ground water contamination
- To investigate the pollution by any means
- To study the scope for irrigation and other significant uses
- To generate baseline data of water quality for management strategies.

Methodology

The water samples were collected from open and boreholes in the study area. Appropriate amount of water samples will be collected polythene bottles from various wells every month. Initially random sampling will be done as per the results (variable as per the condition) sampling sites will be fixed. Analysis various physico-chemical will be done as per the standard methods of CPCB, APHA (1992), Handbook of Methods in Environmental Studies.

Sr.No	Parameter	Methodology adopted
01	Temperature	Thermometric
02	pH	pH meter
03	EC	Conductivity meter
04	TDS	Evaporation
05	Total hardness	Volumetric
06	Calcium	Volumetric
07	Magnesium	Volumetric
08	Sodium	Flame photometric
09	Potassium	Flame photometric
10	Fluoride	Spands/Fluoride meter
11	Turbidity	Turbidimeter

12	Nitrate	Spectrophotomertric
13	phosphate	Spectrophotomertric
14	Chemical Oxygen Demand	Reflux Digestion
15	Bio chemical oxygen demand	5 day Incubation method
15	Heavy metals (Iron and Zinc)	Spectrophotometric/Atomic Absorption Spectrophotmetry

Importance of Study

International Status

Groundwater is the world's most extracted raw material with withdrawal rates currently in the estimated range of 982 km^3 /year. (Margat, J., and J. van der Gun. 2013.)About 70% of groundwater withdrawn worldwide is used for agriculture.

Groundwater provides almost half of all drinking water worldwide.Globally, about 38% of irrigated lands are equipped for irrigation with groundwater.(Siebert, S., et al. 2010). The total volume of groundwater in the upper 2 km of the Earth's continental crust (not inclusive of high-latitude North America or Asia) is approximately 22.6 million km^3, of which 0.1 million km^3 to 5.0 million km^3 is less than 50 years old (judged as "modern" or recently recharged. (Gleeson, T et.al. 2016). The volume of modern groundwater is equivalent to a body of water with a depth of about 3 m spread over the continents.

Groundwater is an important natural resource essential for sustenance of life. Over 98% of the freshwater on the Earth lies below its surface. Chemicals pollute water supply through industrial process and agrochemical applications. (D.B. Panaskaret.al)

National Status

Around 85% of the rural population takes ground water as a resource for drinking and domestic purposes in India [CGWB 2015] In Maharashtra a large section almost 50% of rural and urban population is dependent of ground water for drinking, domestic, irrigation purpose also more and more industries are using ground water due to its uniformity in temperature [MWRRA].

Groundwater can become contaminated naturally or because of numerous types of human activities; residential, municipal, commercial, industrial, and agricultural activities can all affect groundwater quality [Khadri et.al.2015]. In view of the ground contamination, increasing population and industrial as well as urban expansion, the production of wastewater and its disposal on land and water bodies has grown rapidly.

Significance of study:

Groundwater is almost globally important for human consumption, and changes in quality can have serious consequences. It is also important for the support of habitat and for maintaining the quality of base flow to rivers. The chemical composition of groundwater is a measure of its suitability as a source of water for human and animal consumption, irrigation, and for industrial and other purposes. It also influences ecosystem health and function, so that it is important to detect change and early warnings of change both in natural systems and resulting from pollution.

. Hence, regular monitoring and stringent law enforcement is required to develop a strategy to manage the environmental hazards due to wastewater pollution and to improve water quality of ground and surface water for aquatic ecosystem and disease-free human population, respectively. Keeping in view the present study has been undertaken to assess the impact of urbanization and industrialization on ground water samples to assess the physico-chemical characteristics vizTemperaturepH, EC, TDS, Total hardness, Calcium, Magnesium, Sodium, Potassium, Fluoride, Turbidity,Nitrate, phosphate, Chemical Oxygen Demand, Bio chemical oxygen demand, Heavy metals (Iron and Zinc,).

Study area

Udgir is a city with a municipal council in the Latur district, which is located in the Indian state of Maharashtra. It is the second-largest city in the district after Latur. It is located in the Marathwada division of the state (one of the divisions of Maharashtra based on geographical conditions). The city is located very close to the borders of Karnataka and Telangana states. Udgir is home to the historical Udgir Fort built during the reign of Maratha Empire. The town and nearby villages rely mainly on agriculture. The latitude of Udgir, Maharashtra, India is

18.393400, and the longitude is **77.113144**. Udgir, Maharashtra, India is located at India country in the Cities place category with the gps coordinates of 18° 23' 36.2400" N and 77° 6' 47.3184" E.

WORK PLAN

FIELD STUDY	GROUND WATER QUALITY
START OF PH.D WORK	AFTER COMPLETION OF REGISTRATION PROCEDURE
STUDY TERM (STANDARD)	THREE YEARS
FORM OF STUDIES	FULL TIME

STRUCTURE OF RESEARCH WORK

TIME(MONTHS)	**WORK**
00-06	RIVIEW OF LITRATURE AND PREPARATION FOR EXPERIMENTAL WORK ETC
06-30	PROBING OF WATER SAMPLES ITS ANALYSIS AND RELATED WORK
30-36	DATA COLLECTION/STATISTICAL INTERPRETATION, THESIS WRITING AND SUBMISSION

References:

1.Ahluwalia,V.K.(2015).Environmental Pollution and health. New Delhi: TERI

Central Ground Water Board, Ministry of Water Resources, RD &GR Government of India (cgwb.gov.in)

2.C.R. Ramakrishaniah et al., (2009), Assessment of Water Quality Index for the Ground Water in TumkurTaluk, Karnataka State, India, E-Journal of Chemistry, 6(2), 523-530, ISSN: 0973-4945

3. D.B.Panaskar, V.M. Wagh and R.S. Pawar Assessment of Groundwater Quality for Suitability of Domestic and Irrigation from Nanded Tehsil, Maharashtra, India SRTM University's Research Journal of Science.

4. D.Alexakis, "Assessment of water quality in the Messolonghi–Etoliko and Neochorio region (West Greece) using hydrochemical and statistical analysis methods,"Environmental Monitoring and Assessment, 182(1-4), pp.397-413, 2011.

5.Gleeson, T., K.M. Befus, S. Jasechko, E. Luijendijk, and M.B. Cardendas. 2016. The global volume and distribution of modern groundwater. *Nature Geoscience* 9, no. 2: 161-167.

6.https://mwrra.org/groundwater

7.Khadri, S.F.R ChaitanyaPande and KanakMoharir (2013) Groundwater quality mapping of PTU-1 watershed in Akola district of Maharashtra India using geographic information system techniques, International Journal of Scientific & Engineering Research, Volume 4, Issue 9, September-2013.

8.M.V.Prasanna, S.Chidambaram, T.V.Gireesh,T.V.Jabir Ali, "A study on hydrochemical characteristics of surface and sub-surface water in and around Perumal Lake, Cuddalore district, Tamil Nadu, South India,"Environmental Earth Sciences, 63(1), pp.31- 47,2010.

9.Margat, J., and J. van der Gun. 2013. *Groundwater around the World*. CRC Press/Balkema)

10.N.Aghazadeh, A.Mogaddam, "Investigation of hydrochemical characteristics of groundwater in the Harzandat aquifer, Northwest of Iran, Environmental Monitoring and Assessment,"176(1-4),pp.183- 195,2011.

11.Patil P.N. et al., (2012), Physico-Chemical Parameters for Testing of Water – A review, International Journal of Environmental Sciences,3(3) ISSN: 0976-4402

12.R.Nagarajan, N.Rajmohan, N.Mahendran, S.Senthamilkumar, "Evaluation of groundwater quality and its suitability for drinking and agricultural use in Thanjavur city, Tamil Nadu, India,"Environmental Monitoring and Assessment, 171, (1-4), pp.289-308,2010.

13.S.K.Tyagi, P.S.Datta, N.K.Pruthi, "Hydrochemical appraisal of groundwater and its suitability in the intensive agricultural area of Muzaffarnagar district, Uttar Pradesh, India,"Environmental Geology, 56, pp.901–912,2009.

14.Siebert, S., et al. 2010. Groundwater use for irrigation — a global inventory. *Hydrology and Earth Systems Science* 14, no. 10: 1863–1880. www.hydrol-earth-syst-sci.net/14/1863/2010/doi:10.5194/hess-14-1863-2010.

15.Sarla and Ravi Babu P (2012), Assessment of Groundwater Quality Parameters in and around Jawaharnagar, Hyderabad, International Journal of Scientific and Research Publications, Volume 2, Issue 10.

16.Smith, M., K. Cross, M. Paden, and P. Laban. 2016. *Spring — Managing groundwater sustainability*. IUCN, Gland, Switzerland.

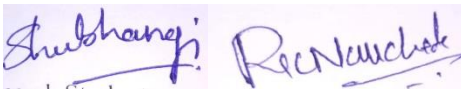
17.Shaikh Ibrahim, SerajAlam, Margub Alum, Faisal Ahemad, Saiyed M Asif, SayedSarfarajShahid, Umar Farook H Momin (2019), A review on ground water quality Assessment of Akkalkuwa Region Nandurbar (Maharashtra), IJSRST volume 6 Issue 2 pp.573-579.

18.Standard Methods for the Examination of Water and waste water (1992)American Public Health Association Washington DC USA.

19.Udit Mohan et al. (2013), Water Quality Assessment and Physico Chemical Parameters of Groundwater in District Hapur, Uttar Pradesh, India, Environment Conservation Journal 14(3), 143-149, ISSN: 0972- 3099 print, ISSN: 2278-5124 online

20.V. Jena et al. (2017), Physico Chemical Analysis of Groundwater of Selected Areas of Raipur City, Indian Journal Science Research, 13(1): 61-65, ISSN- 2250-0138.

21.Z.Ahmad, A.Qadir, "Source evaluation of physic chemically contaminated groundwater ofDera Ismail Khan area, Pakistan,"Environmental Monitoring and Assessment,175(1–4), pp.9–21, 2011.



Research Student

Miss.shubhangiVagamberMalude

Dr.NarkhedeRaju K

Associate Professor & Research Guide

Department of Environmental Science

Maharashtra UdayagiriMahavidyalaya,Udgir

Affiliated to NetajiSubhashchandra Bose College